February 2009: The Working Group „Integrated Protection of Fruit Crops“ is celebrating its 50th Anniversary

Historic Review by
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Abstract

The Working Group looks back at 50 years of successful work. The fruit entomologists are the pioneers within WPRS with respect to the development of integrated plant protection (IPP) and integrated production (IP) and their introduction into practice.
Developments occurring during the early 1970s brought a change in the general approach reflected in the change of name in 1974 from “Integrated control in orchards” to the broader term “Integrated plant protection in orchards”. A further milestone was the establishment of the holistic concept of Integrated Production as has been described in the “Message of Ovronnaz” - a historic landmark for IOBC as a whole.
The publications of the WG reflect the broad range of its activities and its important function as scientific platform for information exchange and joint programs: 13 proceedings of International Symposia on Integrated Plant Protection and Production in orchards, 14 technical handbooks (brochures) and 41 WPRS Bulletins covering specific topics of the various subgroups. The first international symposium organised by the working group took place in Wageningen in 1961 with 36 participants from 9 countries, the most recent symposium was held in Avignon in 2008 with 250 participants and celebrating the 50th anniversary. Hundreds of experts have participated in the WG’s activities over the past 50 years. The impact of these activities on the development and application of IPP and IP in practise was and still is significant. Concepts and tools developed by the WG became not only general WPRS standards but have influenced significantly the international standards for Integrated Plant Protection. The WG has generated the approach and opened the door for the introduction of Integrated Production programs in the major crops of the WPRS region.

A summary of important events is given in the following table.

Year	**Name of Working Group** (Convenor)	**Important events**
1959	***Integrated control in orchards*** (H.J. de Fluiter/NL)	February: Establishment of WG ***“Lutte intégrée dans les vergers »*** in Wageningen/NL by representatives of The Netherlands, Germany, Switzerland and France.
1961		**First meeting and colloquium** on integrated control in orchards at Wageningen, (NL), 5-9 September.
1963		**2nd colloquium** at Stuttgart, (D), 11-13. September.
1964		Week of applied research in Saxon (CH) on faunistic monitoring
1965		**3rd Symposium** at Montreux (CH), 13-15 September.
1968	(H. Steiner/D)	Establisment of WG on “Genetic Control of *Carpocapsa & Adoxophyes*” (Th. Wildbolz/CH. J. de Wilde/NL becomes chairman of Commission “Integrated Control”.
1969		**4th Symposium** at Avignon (F), 9 - 12 September.
1970		Establishment of a first “Subgroup Beneficials” (D. P.Blaisinger/F).
1973		25 May–1 June. Meeting in Lana (I) with decisions to split WG into SG pome fruits and SG stone fruits. June: Joint EPPO/IOBC/FAO meeting on IPP concepts
1974	***Integrated plant protection in orchards***	**5th Symposium** at Bolzano.(I), 3 – 7 September. Establishment of an *ad hoc* “Commission” on “Guidelines for integrated control” (H. Steiner) as subunit of the WG (transformed in 1976 to Commission with new topics).
1975		Establishment of WG “Pheromones” (A.K. Minks/NL).

1976		Important meetings on potential IC labels for fruit. Message of Ovronnaz (birth of the IP concept). Establishment of an *ad hoc* Commission on "IP endorsement" (M. Baggiolini/ CH) as subunit of WG. WG on "Genetic Control of *Carpocapsa* & *Adoxophyes* "becomes Subgroup of orchard group.
1979		**6th Symposium** at Vienna, 8-12 October in the frame of the 25th anniversary celebrations.
1981		Meeting at Colmar: proposal to produce a list of selective pesticides for orchards. General Assembly at Antibes: The IP Commission becomes independent of the WG (J.P. Bassino/F & A. Stäubli/CH).
1984		New Subgroup "Pear" (T. X. Nguyen/F)
1985	(E. Dickler/D)	**7th Symposium** "Integrated Plant Protection in Orchards" at Wageningen, 26-29 August . New Subgroup "Diseases" (D.Butt);
1986		New Subgroup "Package-apple" (L.Blommers/NL) recommending choice of pesticides for IPP.
1988		New Subgroup "Peach" (H. Audemard/F).
1989		New Subgroup "Integrated Fruit Production Guidelines" (E. Dickler /D).
1990		**8th International Symposium on Integrated Plant Protection in Orchards** at Gödöllö (H), 31 July 31 - 5 August.
1991		1st edition of "Guidelines for IP of Pome Fruits in Europe".
1993	(F. Polesny/A)	Transformation of "peach" Subgroup into independent WG "Stone fruits". 2nd edition of pome fruit IP guidelines
1995		**3rd International Conference on Integrated Fruit Production** at Cedzyna (PL), 28 August - 2 September.
1996		New Subgroups "Arthropod Pests" (M. Solomon/UK) and "Soft Fruits" (D. Gajek/PL)
1998		**4th International Conference on Integrated Fruit Production** (10th Symposium on Integrated Plant Protection in Orchards) at Leuven (B), 27 July -1 August (Joint IOBC-ISHS International Conference).
2000	(J. Cross/UK)	**5th International Conference on Integrated Fruit Production** at Lleida (Spain), 22 - 26 October. 1st edition of Guidelines for IP of Soft Fruits.
2002		3rd edition of IP guidelines of Pome Fruits.
2003		WG "Stone fruits" (P. Cravedi/I) becomes Subgroup of orchard group.
2004	***Integrated protection of fruit crops***	**6th International Conference on Integrated Fruit Production** at Baselga di Piné (I), 26 - 30 September.
2008	(C. Ioriatti /I)	**7th International Conference on Integrated Fruit Production** at Avignon (F), 26 - 30 October.

Prologue

The history of the WPRS Working Group "Integrated Protection of Fruit Crops" – celebrating in 2009 its 50th anniversary – also reflects the history of Integrated Plant Protection (IPP) and of Integrated Production (IP) in Europe. In this review we have decided to focus our attention especially on the first 25 years.

The history of the Working Group (WG) – in IOBC usage often referred to as "orchard group" - is well documented thanks to the WPRS Bulletins published since 1971.The developments starting in the early 1950s and leading to the concept of IPP and IP in Europe have been described in several reviews such as by Baggiolini (1990, 1998), by Minks et al. (1998), by Boller et al. (2006), or by Wildbolz (1983), and are complemented by many documents of the new IOBC archive. Developments occurring outside Europe have been described e.g. by Kogan (1998) focussing entirely on the North American situation.

In retrospect we can agree with the quotation in the recent IOBC history book (Boller et al. 2006) that "*applied entomologists involved in apple production can be considered in many respects as the pioneers of integrated pest management and later in the development of Integrated Production*". This prominent citation of entomologists requires some explanations: Why orchard entomologists? Were they smarter than their colleagues working in other crops or smarter than the plant-pathologists? The answer is obvious: Of course not! Orchard entomologists were not smarter but simply among the first plant protection specialists confronted in the 1940s with serious problems emerging in modern orchards. Intensification of the production had started here earlier than in (most) other crops. And consequences followed. Unexpected outbreaks of spider mites, leaf miners and aphids occurred in newly planted orchards. The trees grew much longer than the old-fashioned standard trees, providing better food for such pests. New insecticides such as DDT favoured directly spider mite multiplication and eliminated natural enemies. Repeated insecticide application made the situation worse (insecticide resistance etc.). An additional problem was that the market increasingly asked for unblemished fruits. And finally, the consumers feared toxic insecticide residues. So experts had to search for effective and sustainable solutions.
The plant-pathologists faced similar problems ca.10 years later and the herbologists some 20 years later. Hence, many orchard entomologists of that time were forced haphazardly into new research priorities, becoming the by serendipity the pioneers in the development of integrated pest control and later of integrated production.

1948 – 1958: The early period of integrated pest control (IC)

Research and developmental activities on alternatives to chemical pest control started in the early 1950s independently by individual entomologists all over the world. They investigated the negative impact of pesticides on pest and antagonist species, developing sampling techniques and struggling with the largely unknown identification of the collected insects. Publications of that early period report on local activities taking place in Nova Scotia/Canada (e.g. Pickett et al., LeRoux et al.), California (e.g. Smith,van den Bosch), England (Massee, Wigglesworth), Germany (Steiner), Switzerland (Schneider, Geier, Bachmann, Vogel, Baggiolini, Wildbolz) and the Netherlands (Kuenen, Voûte, de Fluiter). However, it appears that until the end of the 1950s the information flow between scientists in different continents and even countries on practical achievements made was very limited or even not existing.

1958 as turning point

The year 1958 presents itself in several aspects as critical turning point towards team-oriented activities:
For the first time results of field experimentation conducted in North America and Europe were presented at the 10th International Congress of Entomology in Montreal as international forum (e.g. Pickett et al. 1958). The term "integrated control", originating from Californian researchers (Michelbacher & Bacon 1952; Stern et al. 1959; Smith & Hagen 1959) was accepted by the international scientific community.

In Europe, two important events became relevant for the establishment of the IOBC "orchard Group":
First, in spring 1958 one of the first national networks was established as "Research Team for Harmonious Control of Pests" in the Netherlands coordinating the respective activities. Involved in that group were entomologists of the Wageningen University (de Wilde, Ankersmit) and of IPO (de Fluiter, Brader). This particular group should later become catalyst and locomotive of further developments under the umbrella of IOBC.

Fig. 1: Jan de Wilde (Wageningen/NL)

Secondly, in spring 1958 the first encounter occurred between the classical biocontrol and integrated control approach within IOBC. It was unspectacular and took place at the 1st General Assembly of IOBC held in 1958 in Paris, where J. de Wilde (Wageningen/NL) participated as observer (the Netherlands became an official IOBC member only in spring 1959).
He proposed a closer collaboration between IOBC and relevant international organisations (such as EPPO) in the coordination of information and experimental activities concerning the impact of pesticides on the beneficial fauna in agriculture and forestry. The protocol on the short discussion within the Executive Committee suggests that the matter was considered as a minor side-aspect of the main focus of IOBC (WPRS 1958). The General Assembly decided to give H.J. de Fluiter (IPO/Wageningen) the mandate to write a report on future possibilities of such collaborative activities, above all with the IOBC taxonomy centre at Geneva, that could serve as basis for a future Council decision to establish a "working group *ad hoc*" compiling relevant information.

However, the Dutch orchard entomologists - already active in the field of "integrated pest control" - did have different visions. De Fluiter did not waste much time in writing reports but decided to turn the existing Dutch working party into an international working group.

1959: The establishment of the IOBC Working Group "Lutte intégrée dans les vergers/ Integrated control in orchards"

In February 1959 de Fluiter called in a preparatory meeting at Wageningen / NL with representatives from The Netherlands (de Fluiter), Germany (Steiner), Switzerland (Wildbolz) and France (Benassy) to review the situation in Europe. The participants agreed in the establishment of an IOBC Working Group on "Integrated Control in Orchards" with de Fluiter as chairman. They decided to make an inventory of specialists and institutions to be contacted as potential members. De Fluiter later informed IOBC Council that the WG had been established.
From there the WG unfolded impressive activities.

People and time markers.

People: More than 250 persons participated in the last Symposium taking place in October 2008 in Avignon/ France. There were hundreds and hundreds of persons participating in the activities of the WG over the past 50 years and contributed to its success. However, in retrospect three persons of the very beginning of the WG deserve special attention without ignoring the merits of all others:

Fig. 2: Hendrik de Fluiter
Wageningen/NL

Fig. 3: Hans Steiner
Stuttgart / D

Fig. 4: Mario Baggiolini
Changins-Nyon / CH

Hendrik de Fluiter established the WG and acted as chairman until 1968. Hans Steiner was part of the group right from the start and acted as chairman from 1968 until 1985. Mario Baggiolini joined the group in 1959, established in 1976 the IOBC Commission on IP labels and retired in 1981. Steiner and Baggiolini complemented each other with their personalities and talents and formed a powerful team. Hans Steiner presented already at this first meeting preliminary results of his faunistic studies carried out since 1953 with the beating technique and of the impact of certain pesticides (Figures 5 and 6).

Fig. 5: The beating funnel of Steiner

Fig. 6: Arthropod collection funnels used by Steiner

Historic time scale and time markers of the WG.
IOBC Council and the individual working units have their individual time scales and markers that characterise their history. Whereas the regular General Assemblies with date and location provide the time markers for IOBC as organisation, the time scale and markers of the "orchard group" are characterised by the Symposia of the WG as shown in figure 7. These were organised at the beginning in 2 years intervals, later every 4-5 years. Several events can be considered "Historic milestones" (red circles) and occurred between Symposia.

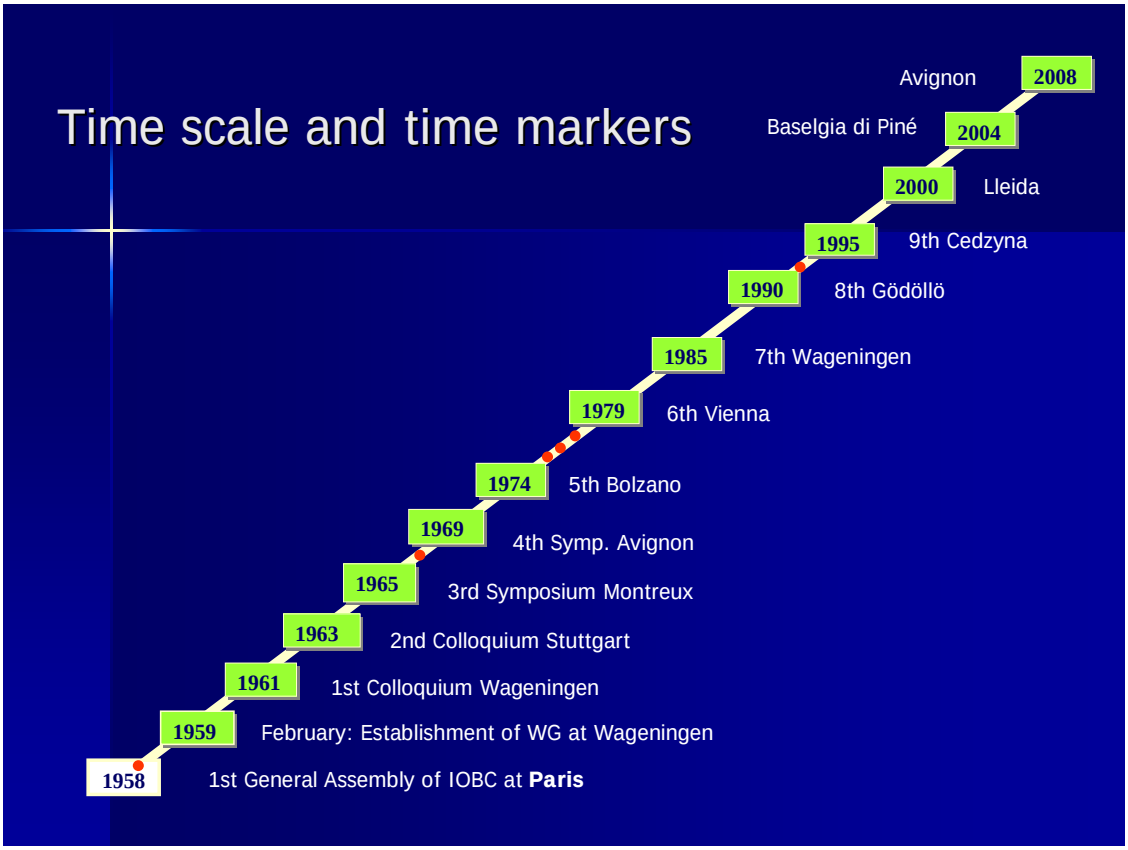

Figure 7: The specific time scale and time markers of the "orchard group"

Can we recognise periods with specific topics and activities? Hans Steiner identified in his report of 1977 three distinct periods as follows:
"Twenty years ago we focussed our interest on the apple tree fauna and their responses to pesticide treatments. So we learned some details of this particular ecosystem. Later on we were dealing with economic thresholds to avoid superfluous chemical treatments. Then we have seen that our method was also preferable in relation to the

problem of residues. Now we are sure that we have available a good protection and production system well fitting in with ecological, economical and toxicological requirements of the environment and also with the intrinsic quality of agricultural products" (WPRS 1977). The approximate duration of these periods is shown in fig. 8. We have added a fourth period covering the time span from ca. 1989 and spreading into the 2000s. It could be characterised by "Field application of Integrated Production".

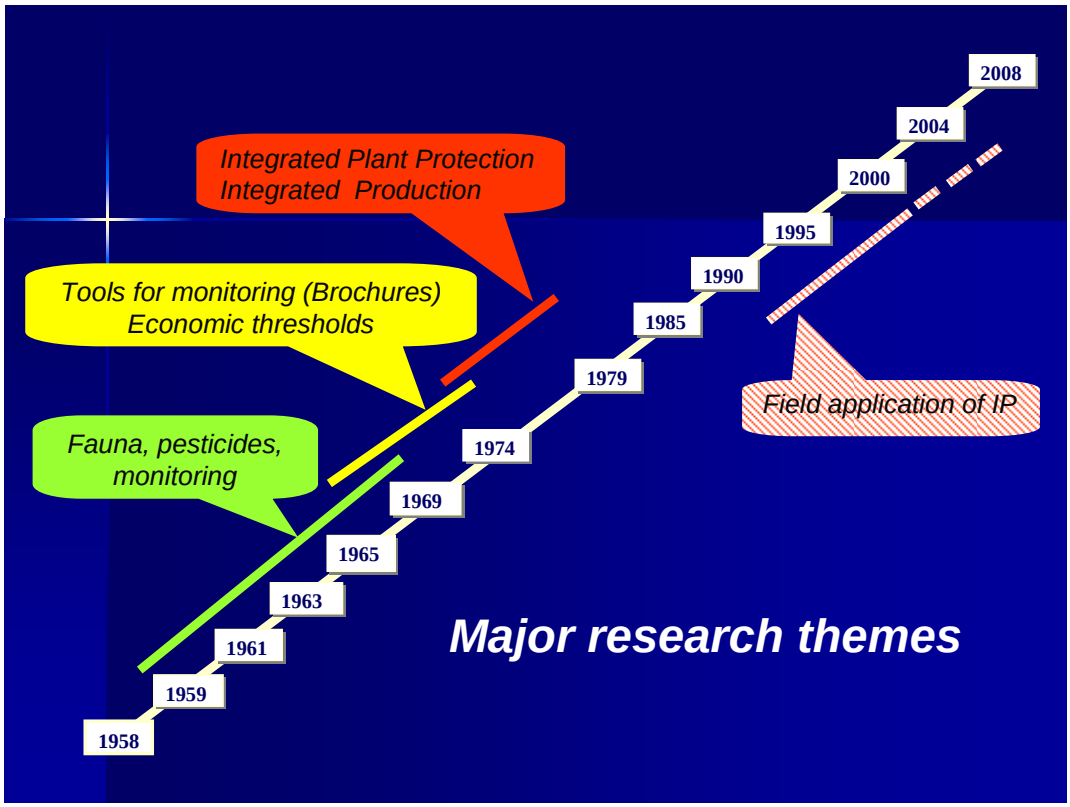

Figure 8: Major activity periods of the working group

1959 – 1969: Period of "Apple tree fauna and pesticide impact". The consolidation of the WG within IOBC.

The first 10 years of the orchard group were extremely stimulating and fruitful as shown by the Proceedings of the four International Symposia on Integrated Control in Orchards ("Colloques sur la lutte intégrée dans les vergers") held in 1961 (Wageningen), 1963 (Stuttgart), 1965 (Montreux) and 1969 (Avignon).

First Colloquium on Integrated Control in Orchards", Wageningen, 5-9 September 1961 with 36 specialists from 9 countries (WPRS 1961).

We give here - for the records - the complete list of the participants:
Germany 5 (G.Dosse, J.Franz, F.Schütte, H. Steiner, H.Till; *Belgium 3* (W.E. van den Bruel, A. Soenen, G. Vanwetswinkel); *Denmark 1* (J. Jorgenson); *Egypt 1* (Mostafa Hafez); *France 5* (C. Bénassy, L.W.D Caudri/EPPO, P.Grison, B. Hurpin, H. Milaire); *England 1* (R.C. Muir); *Italy 1* (G.Domenichini); *Netherlands 15* (G.W. Ankersmit, A.F.H. Besemer, L. Bravenboer, H.H. Evenhuis, H.J. de Fluiter, J. van Hennik, J.G. Ten Houten, D.J. de Jong, H. Klomp, D.J. Kuenen, P.A. van der Laan, A. Post, A.D. Voûte, M. van de Vrie, J. de Wilde); *Switzerland 4* (M. Baggiolini, P. Bovey, E. Günthart, Th. Wildbolz).

This first meeting of European specialists opened an important platform for the exchange of information, the discussion and identification of gaps in knowledge and needs for further research and last, but not least, the co-ordination and pooling of the limited national resources in a highly effective network. The Proceedings of this "Colloquium" are well documented (WPRS 1961). The two resolutions formulated at the end of the symposium stimulated greatly the initiation or intensification of experimental activities in most European countries and read as follows:

1. The necessity to maintain a high production in intensively cultivated fields calls for a methodical and rational combination of all pest control methods which make possible the maximum utilization of natural enemies of pests.
2. Consequently, it will be necessary:
a) To intensify basic research in two directions: ecology and taxonomy;
b) To work out such experimental methods which will facilitate the interpretation of the results and their extrapolation into practical farming conditions;
c) To develop methods of integrated control and to take this method of control into consideration when testing and applying pesticides.
With this working program the WG added a new systems approach to the classical biological control focus of IOBC. Also it is evident that the members of the WG put right from the beginning high emphasis on the transfer of scientific wisdom into robust and practical tools for the farmers.

The participants designated contact persons stimulating and coordinating the activities in their respective countries as follows: Denmark: J. Jorgenson (Lingby); France: C. Bénassi (Antibes); Germany: H. Steiner (Stuttgart); Italy: G. Domenichini (Milano); Netherlands: H.J. de Fluiter (Wageningen); Switzerland: Th. Wildbolz (Wädenswil); United Kingdom: G.H.L. Dicker (East Malling);

Second Colloquium on Integrated Control in Orchards", Stuttgart/Germany, 11-13 September 1963
with 39 specialists from 11 countries : Germany 11, Belgium 4, Denmark 1, France 6, Israel 1, Italy 4, Norway 1, Netherlands 5, Poland 1, Sweden 1, Switzerland 4 (WPRS 1963).
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After a first review of the situation and progress made since the first symposium of 1961 the participants started to discuss and initiate concrete joint research programs in the field of sampling techniques and faunistic studies. Interesting is the extension of traditional entomological activities to aspects of insect pathogens and autocidal (genetic) control (that showed first successes in Switzerland (*Melolontha*), USA (screwworm) and Canada (codling moth)) as documented by the resolutions taken:

« Les participants recommandent:
1) que le groupe de travail « ad hoc » de la CILB devéloppe les investigations sur les germes ***entomopathogènes*** *susceptibles d'être incorporés dans les programmes de lutte intégrée en arboriculture fruitière...*
2) que le Bureau Exécutif de la CILB s'intéresse aux ***méthodes autocides*** *de contrôle des populations de ravageurs, en particulier aux possibilités offertes par la stérlisation,.....*
3) au Gouvernements des pays représentés au Colloque et les membres de la CILB de consacrer au développement des procédées sélectifs de lutte les ***moyens financières*** *qui correspondent à l'importance actuelle des problèmes posés par la lutte intégrée. »* (WPRS 1963).

After the symposium, de Fluiter - now vice-president of IOBC- produced a report concerning organisation, research programme and activity of the **Groupe de travail « Lutte intégrée** (de Fluiter 1963).

3rd Colloquium on Integrated Control in Orchards", Montreux/Switzerland, 13-16 September 1965 (WPRS 1965). Participation of 65 specialists from 16 countries: Belgium 4, Czechoslovakia 1, Denmark 1, Egypt 2, England 1, Finland 1, France 5, Germany 8, Israel 1, Italy 9, Netherlands 10, Norway 1, Poland 4, Sweden 1, Switzerland 16, USA 2.

The 3rd symposium demonstrated clearly the progress made in most countries during the last 4 years (see Fig. 9). De Fluiter presented a detailed definition and analysis of "harmonious" and "integrated control" which profited by the presence of the Californian IPM specialists Ray Smith and Ken Hagen on their way to the first FAO Symposium on Integrated Pest Control in Rome. The main topic of the symposium was the development of standardised sampling methods and interpretation of data. Interesting reports on IC status in all present countries were given. It was stressed that the professional training of field advisers was important and that the translation of the scientific knowledge into adequate robust and simple tools for the farmers were necessary. This was the prologue of the preparation of the brochure series with its first publication in 1968.

Resolutions *: « ...développement de la méthode intégrée par les mesures suivantes :*
- perfectionnement et normalisation des procédés de recensement de la faune ;
-détermination des seuils critiques pour les ravageurs ;
- lâchers d'auxiliaires multipliés en laboratoire ;

- *maintien et accroissement des produits antiparasitaires sélectifs et des moyens biologiques proposés par l'industrie grâce à une intervention financière des pouvoirs publics destinée à favoriser l'essor de ces produits pour lesquels les industriels sont enclins à se désintéresser, uniquement pour des raisons d'ordre économique ;*
- *formation de cadres techniques, en vue de favoriser l'application de la lutte intégrée au niveau de la production . »*

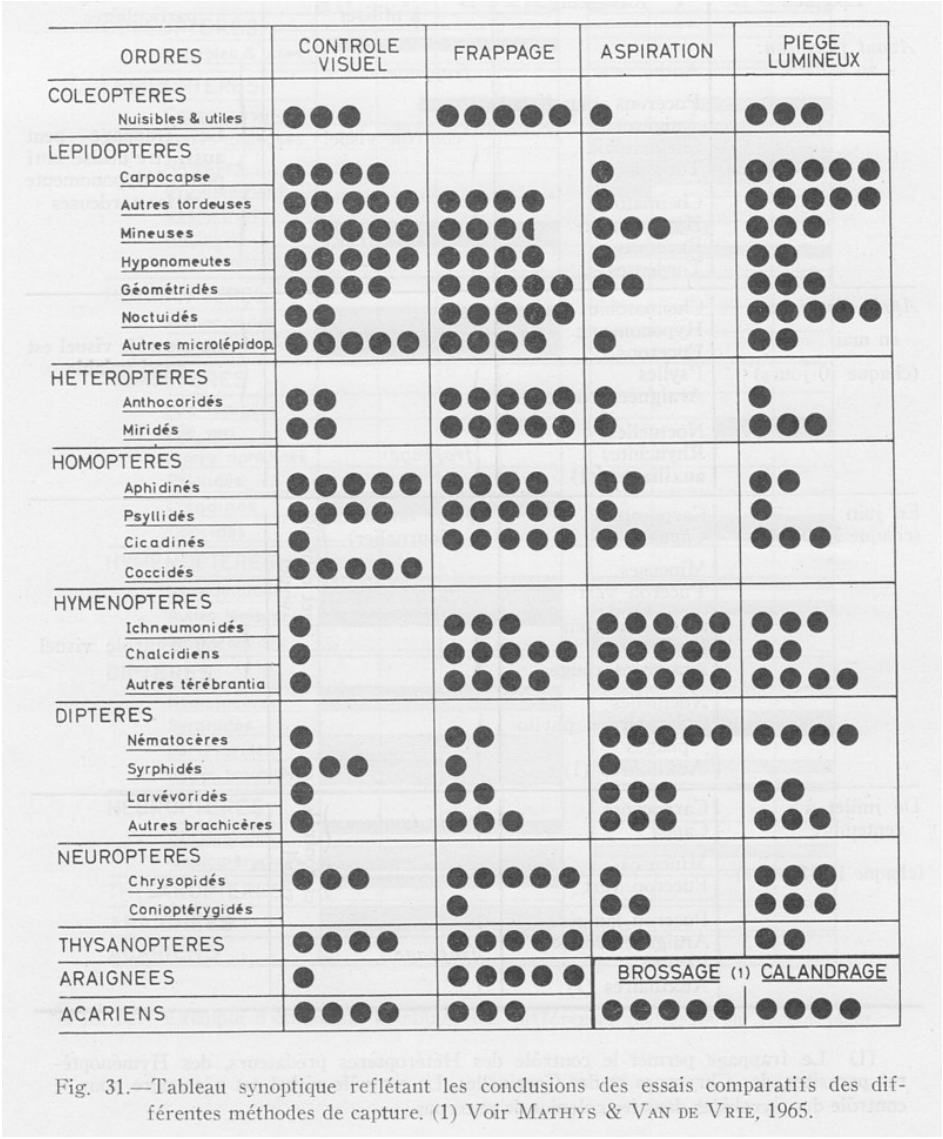


Fig. 31.—Tableau synoptique reflétant les conclusions des essais comparatifs des différentes méthodes de capture. (1) Voir MATHYS & VAN DE VRIE, 1965.

Figure 9:

The 3rd symposium of 1965 showed that the WG had reached a high degree of competence in the monitoring of orchard pest populations and of pesticide impact on the fauna as shown in the **synoptic table** presented at the symposium.

„Contrôle visuel" had its roots in Switzerland, the beating technique in Germany, the suction method in England and the light traps possibly in the Netherlands.
The sex pheromone traps were not included as they became available only in the 1970s.

The *working program* was established as follows: 1. Perfecting the sampling methods; 2. Observations on the critical levels of the orchard pests; 3. studies on interrelations between noxious organisms and their natural enemies; 4. Studies on effect of physiological and biochemical condition of host plant on development of harmful insects and mites (Chaboussou); 5. Perfecting the integrated control spray scheme (WPRS 1965).

1968 – 1975: The period of "Economic thresholds and tools"

This period is characterised by the development of efficient monitoring tools for pest populations, by the definition of threshold values for key pests, by the publication of practical manuals (brochures) for the farmers and by the establishment of 3 new WGs as "spin-offs" of the "orchard group".
Generally spoken (and anticipating the evolutionary steps of plant protection identified in 1976 in the "Message of Ovronnaz" (Steiner et al. 1977)) we can say that the real progress achieved during this period is the fact that the plant protection methods in fruit growing practice moved from stage 2 (i.e. "Chemical control based on advice") to stage 3 (i.e. "Guided/Supervised control") (see Table 1).

1968: 4th General Assembly of IOBC in Paris (WPRS 1968).
After 10 years of successful leadership de Fluiter stepped down as convenor for health reasons. De Wilde, Wageningen/NL (now IOBC Vice-President) became chairman of a new Commission on Integrated Control and Hans Steiner, Stuttgart/Germany became Council member and new chairman of the "orchard group".
The General Assembly decided also to establish two new WGs as "spin-offs" of the orchard group, namely the WG "Genetic control of *Carpocapsa* and *Adoxophyes*" (Th. Wildbolz/CH) and the WG "Genetic control of *Rhagoletis cerasi"* (E. Boller/CH). The *Carpocapsa/Adoxophyes* WG established a fruitful collaboration with US and Canadian colleagues working on the same problems. In Europe, codling moth population suppression could be obtained in certain localities by the release of sterile insects. However, a total elimination of local populations could not be achieved due to the insufficient isolation of apple orchards. In 1974 the WG proposed "to enlarge its field of action and to consider all the methods that can help to reduce populations of *Carpocapsa*" (WPRS 1974a) and became later a subgroup of the orchard group.

Steiner, Baggiolini and many other colleagues had collected important data on the apple tree fauna and economic thresholds of various insect pests in just a few years. They published these data in 1968 in the WPRS Brochure No.1 entitled: "Anleitung zum integrierten Pflanzenschutz im Apfelanbau (Introduction into integrated plant protection in apple orchards) (Steiner & Baggiolini 1968). This first document was followed in 1971 by Brochure No. 2 "Visuelle Kontrollen im Apfelanbau" (Visual checks in apple orchards) (Baggiolini et al. 1971); in 1974 by Brochure No. 3 „Nützlinge in Apfelanlagen" (Beneficials in apple orchards) (Milaire et al. 1974) and in 1975 by Brochure No.4 „Die Klopfmethode" (The beating method) (Steiner et al. 1975). This was an unequalled production of information that was of great practical value for both growers and advisory services (all Brochures produced by the WG are shown in Appendix 1).

1969: The 4th International Symposium held in Avignon was a great success with 113 specialists from 17 countries and 3 international organisations (FAO, IAEA and EPPO), (WPRS 1969a).

Integrated control was now feasible in almost all situations in apple production and became also economically interesting where economic damage thresholds were applied. Important topics were the quantitative assessment of population densities and the „seuil de tolerance"(intervention - and economic thresholds).

Figure 10:
Dutch fruit growers are trained to recognize bad and good insects before they start with IPM (1970).

Further improvements were predicted by increased collaboration between entomologists and plant pathologists. IPP apple orchard surfaces reached now in the Netherlands 12 ha, France 40 ha, Western Switzerland 47 ha, and Germany ca. 200 ha. The state of the art allowed now to exclude certain insecticides and fungicides from IPP programs with considerable effects. It was observed that different formulations of the same active ingredient can affect antagonists differently**.**

The general impression of the Proceedings is in retrospect that this WG had reached a high level of international reputation and professional competence and was „on the move"(also into additional fruit crops and southern climates) (WPRS 1969a). However, the "orchard group" with its multilingual clientele and constant increase of participants had reached the limits of its logistic capacity and feared a certain loss of effectiveness. Therefore, it was decided to organise future symposia in larger intervals of 4 - 5 years. Specific problems should be discussed and developed in smaller, more efficient meetings of the specialists concerned (WPRS 1969b).

This organisational diversification proved to be highly successful. It had already in 1968 resulted in the establishment of the closely affiliated WGs on "Genetical control" followed in 1970 by the formation of a special task

force (later called subgroup) on pesticide impact on beneficial arthropods, in 1974 of an *ad hoc* "Commission on Labels" and in 1975 by the establishment of a WG on " Pheromones" (A.K. Minks/NL).

1970: Side-effects of pesticides: Already in 1959 Steiner had been approached by the German plant protection service postulating a close collaboration with specialists of the WG in the development of test procedures for pesticides that should be field tested in 1970 and possibly become components of the official registration procedure in Germany (WPRS 1969b). As a result a Subgroup "Beneficials" had been established by D.P. Blaisinger (Colmar/France) and focussed not only on measuring and documenting the side-effects of pesticides but also on the development and standardisation of the test-procedures. This activity undoubtedly stimulated the establishment of a new IOBC WG on "Pesticides and Beneficial Organisms" in 1974 by J. Franz/D. However, the orchard group maintained its own working unit on pesticides until its last meeting in 1985, when its cope was redefined and enlarged in 1986 by establishing the new subgroup "Package/apple".

1974: It is evident that all these innovative activities of the "orchard group" found their precipitations in viticulture where leading orchard entomologists were simultaneously involved (e.g. M. Baggiolini, M. Baillod and A. Schmid in Switzerland, H. Milaire and J.P. Bassino in France). This led in 1974 on initiative of Baggiolini to the establishment of the IOBC WG on "Integrated Control in Viticulture" (M. Baillod/CH).

1975: Establishment of the WG on Pheromones (A.K. Minks/NL) as spin-off unit of the "orchard group". Research had led to the identification of first sex pheromones in lepidopteran pests and made their use in new trapping systems feasible (Minks & de Jong 1975; WPRS 1975).

1973 – 1979: New concepts of Integrated Plant Protection and Integrated Production

The 1970s were probably the most dynamic period for both the WPRS and the "orchard group". It can be characterized by 5 steps from Integrated Control via Integrated Plant Protection to Integrated Production:

1). Acceptance of a new definition of IPP in 1973/74;
2). Discussions about potential commercial labels for fruit produced under IC programs in 1974 -1976;
3). The "Message of Ovronnaz "and the creation of the concept of "Integrated Production" in July 1976;
4). Establishment of an "IP Commission" in November 1976 and the first WPRS endorsed farmers'organiations (1978); and
5). Conclusion of this period with a large WPRS Symposium on Integrated Plant Protection by celebrating its 25th anniversary" in Vienna (1979).

In this period plant pathologists became more and more involved in the group's activity.

1. New Definition of Integrated Control and Reorganisation of the WG

In ***1973*** two important meetings took place that had a major influence on the WG's policy (WPRS 1973): The meeting of Lana and the international conference of Vienna.

a) The meeting at Lana (South Tyrol) from 25 May-1 June with 11 members from 7 countries decided to split the WG into two subgroups "Pome Fruit" (Gruys/NL; pears Bassino/F) and "Stone Fruit" (Milaire/F; peach Touzeau/F), respectively. This should facilitate the information flow among the 116 members in 18 countries and avoid that important achievements were not made readily available to advisors and growers. The potential creation of a SG "Soft fruit" was discussed but delayed until 1996. The WG also proposed to establish an IOBC/WPRS WG on "Pesticides and Beneficial Arthropods" (which happened in 1974).
Important for the evolution of IPP in practice was the decision to organise a special meeting in Wageningen (Gruys) in January 1974 with leading stakeholders to discuss their expectations and ideas concerning the standardisation of food labels.
Furthermore it was decided to accept basically the definition of Integrated Control as it was formulated by the FAO panel. However, in view of the upcoming joint meeting with FAO the WG asked the Secretary General (Lucas Brader) to have the definition slightly extended by FAO in order to express more strongly the WG's opinion that more emphasis should be laid on the natural mortality and regulation factors of the agro-ecosystem. Later in the year WPRS Council agreed with the following IPP definition:

Definition of Integrated Plant Protection

(FAO definition of 1967 with IOBC adaptation 1973)

All economically, ecologically and toxicologically defensible methods will be applied to keep damaging organisms below economic damage levels whilst conscious exploitation of natural control factors is emphasized.

b) One month later the Joint EPPO-IOBC-WPRS Conference on Integrated Approaches in Plant Protection took place in Vienna with 75 participants from 21 countries and 6 international organisations (including FAO, FAO/IAEA, AID/UC, GIFAP, IIRB and IRCT). Its objective was the re-examination of the IPP definition of FAO 1967. The recommendation panel consisting of 13 persons was chaired by G. Mathys (EPPO); WPRS was represented by E. Biliotti and L. Brader. R. F. Smith represented the University of California. As the recommendations influenced later the IOBC concept 1976 of IP we show here the part of the protocol concerning the IPP definition:

"The new concept based on ecological principles may be explained as the optimum integration of all suitable techniques to achieve economical control with minimum ill effects on non-target species, the food chain and the environment. To achieve this, emphasis is laid on:
- Consideration of economic thresholds
- Deliberate safeguard and development of antagonisms, including habitat management
- Increased use of resistant varieties." (WPRS 1973).

2. Labels

The chronological events leading finally to an IOBC/WPRS endorsed label for fruit produced under defined IP procedures are well documented (Steiner et al. 1977). A series of meetings took place and produced the following results:

22-23 January ***1974***: WPRS meeting in Wageningen/NL organised by P. Gruys on "Problems associated with the introduction of integrated control practices into orchards". It was concluded that the introduction of IC did not necessitate a change of the existing quality standards but that a label indicating the special quality of fruit cultivated in orchards with integrated control and other environmentally favourable cultural practices would be preferable. It was decided that an *ad hoc* committee composed of representatives of the EEC, OECD, Marketing Organisations, EPPO and the WPRS should try to formulate the contents of such a label. The WG established an internal "*ad hoc* Commission for Labels", attached to the WG, with a mandate to study and coordinate developments with labels and guidelines in the fruit sector (H. Steiner, P.Gruys, H.G.Milaire and M.Baggiolini).

2 April 1974: IOBC-OECD-CE-EPPO Conference in Paris chaired by L. Brader. Recommendation that "IOBC should prepare for OECD documentation on integrated control and on the possible creation of a label to be discussed at the September meeting".

30 September 1974: OECD-IOBC meeting in Paris. It was pointed out that the introduction of a label would necessitate production guidelines that should not be restricted to an improved plant protection but also include agronomic aspects such as pruning, fertiliser use, fruit thinning and optimisation of the intrinsic fruit quality.

10-11 November ***1975***: WPRS Council meeting in Paris. A decision was taken to develop further the guidelines for IPP based on the existing dossier and to investigate the procedures for the introduction of a label in practice.

22-23 January ***1976***: Joint IOBC-EPPO-EC meeting at Stuttgart on international and regional guidelines for IPP. Proposal to establish an IOBC/WPRS Commission for evaluation and endorsement of regional IPP guidelines and implementation of labels. *"In the preparation of such (regional) guidelines, initiative should be taken by those locally responsible in the region concerned, with subsequent submission to IOBC/WPRS for approval, preferably by a national committee"* (WPRS 1976).**The idea of an IOBC- endorsement system was born!**

On request of the EEC Lucas Brader prepared a report on "Practical aspects of the application of integrated pest control methods". At this point things were progressing nicely and the practical implementation of an international standard for IPP and labels under IOBC leadership were in sight. But then a small meeting of the WG organised in July 1976 in Ovronnaz added a new dimension.

3. The meeting of Ovronnaz and the birth of Integrated Production (IP)

This meeting organised by M. Baggiolini and H. Steiner from 9-11 July, 1976 at Ovronnaz became a WPRS landmark resulting in the creation of the concept of Integrated Production and the establishment of the WPRS Commission of Integrated Production. A group of five entomologists met in the Alpine village of Ovronnaz in Switzerland, discussed the situation, sorted out the essential elements and produced a document called the "Message of Ovronnaz",.that still can be considered the corner stone of modern Integrated Production (Steiner et al. 1977). Key element of their conclusions was the need to abandon the isolated view of plant protection and to place it in the context of the entire farm operations. Valid up to date, with minor adaptations, is their table of evolutionary steps in plant protection shown below (Table 1).

We are grateful to the late Mario Baggiolini, promoter and participant of that meeting, for providing the historic picture taken at that occasion .

Figure 11: Participants of the Ovronnaz meeting (from left to right): G. Altner (D), H. Steiner (D), G. Celli (I), F. Schneider (CH), M. Baggiolini (CH).

Table 1: The evolution of plant protection methods (Steiner et al. 1977; Baggiolini 1998)

1. Blind chemical control (Lutte chimique aveugle)	General, schematic and routine applications of the most potent pesticides; advice from industry.
2. Chemical control based on advice (Lutte chimique conseillée)	Application of usually broad spectrum pesticides after consultation with an official advisory service.
3. Guided control (Supervised control) (Lutte dirigée) *Transitory phase*	Introduction of the concept of "economic threshold levels"; application of pesticides with no negative side-effects on natural enemies; protection of beneficial organisms.
4. Integrated plant protection (Protection intégrée) *Dynamic phase*	Similar to guided control, but in addition integration of biological and biotechnical methods and methods of good agricultural practice; chemical control strongly regulated.
5. Integrated agricultural production (Production agricole intégrée) *Open dynamic phase, further development possible in the whole world*	Similar to integrated plant protection, but in addition observation, integration and exploitation of all positive factors in the agro-ecosystem according to ecological principles.

Up to now the discussions had focussed on the practical problems connected with the implementation of Integrated Plant Protection and the establishment of commercial labels. The breakthrough for Integrated Production occurred during the meeting in Ovronnaz.
Steiner summarised the outcome of the meeting in his report to the 3rd General Assembly 1977 as follows: "The Message of Ovronnaz is a statement on guidelines desirable for plant protection and production in the future. It became obvious that plant protection could not be regarded isolated, but should be examined within the whole context of production, marketing, food-industry and the consumer. The production and protection methods to be used should take into account both the quality of the products and the effects on the ecosystem".

4. IP Commission established

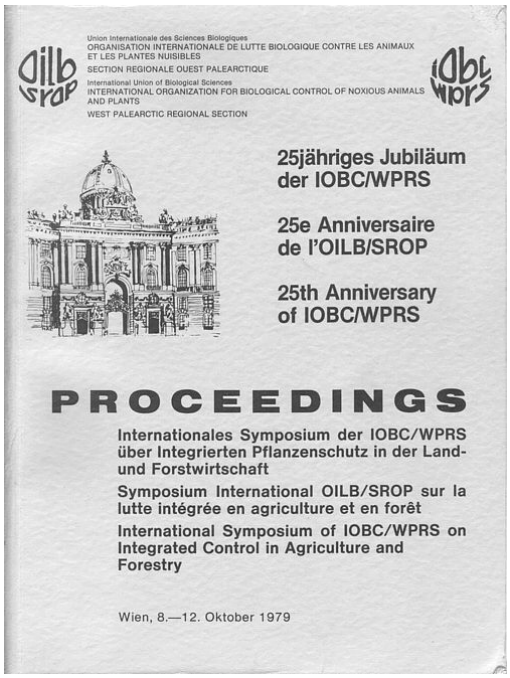
24-25 November ***1976***: The WPRS Council discussed the proposal of Steiner to establish a Commission for the endorsement of regional guidelines. However, since the "Message of Ovronnaz" had not yet been published and had been sent to the Council members only as a draft document, the Council was apparently not fully aware of the important conceptual change from "Integrated Control" to "Integrated Production". Therefore, it decided on the establishment of an *ad hoc* Commission on "Integrated Pest Control Guidelines" and nominated Baggiolini as chairman. Baggiolini immediately changed the name to Commission "Valorisation qualitative de la production intégrée" and Steiner hastened to publish the Ovronnaz report without further delay (Steiner et al. 1977).

1978: The Council established a "Comité international" for the actual endorsement procedures with J. M. Thiault (F) as president. A Swiss (GALTI) and a French (COVAPI) growers' association qualified for the use of the IOBC label "on an experimental basis".

Figure 12:

IOBC/WPRS IP Label issued in 1978 for GALTI

5. IOBC celebrates its "25th Anniversary" in 1979



The 6th Symposium of the „orchard group" co-incided with the big International Symposium of IOBC/WPRS on „Integrated Control in Agriculture and Forestry" taking place from 8 – 12 October 1979 in Vienna (WPRS 1979a).

IOBC has always been flexible with its birthdays. For whatever reasons, in October 1979 the situation was ripe to celebrate its 25th anniversary.
Perfectly organised by K. Russ and his team, IOBC/WPRS celebrated its silver jubilee in the impressive atmosphere of the Viennese Hofburg - the former residence of the Austrian-Hungarian Emperors.

Not less impressive is the coverage of all WPRS activities by the "Proceedings of the International Symposium of IOBC/WPRS on Integrated Control in Agriculture and Forestry", Vienna, 8-12 October 1979 (Figure 13).

Figure 13: The "Anniversary Book 1979"

1979 – 1988: The period of diversification and consolidation

***1981:* 4th General Assembly of WPRS at Antibes**

In 1981 Baggiolini retired from the Commission and delivered at the 4th General Assembly a strong plea in favour of Integrated Production (Baggiolini 1982). The General Assembly gave the Commission now the status of a statutory Commission, nominated J. P. Bassino (F) as new chairman and closed down the "Comité international". The Commission remained focussed on fruit production, gradually slowed down its activities and was terminated by Council in 1987.

Restructuration

In ***1984*** the WG started to establish additional „subgroups"in order to focus on specific aspects: The first addition was the SG „Pear"(T.X. Nguyen/F).

At the occasion of the ***7th Symposium*** taking place in ***1985*** in Wageningen Hans Steiner retired as convenor and was replaced by Erich Dickler (Dossenheim/D).
The Subgroup "Diseases" was established (D. Butt/UK) and brought the multidisciplinary dimension requested for more than two decades. It organised its first workshop in 1987 in Lana/Southtirol (H. Oberhofer) and the second one in 1988 in Brissago/Switzerland (C. Gessler).
At the same time it was decided to close the Subgroup on "Influence of Pesticides on the Beneficial Fauna in Fruit Trees" (P. Blaisinger/F) as the matter was now developed further in the WG "Pesticides and Beneficial Arthropods" established in 1974.

In ***1986*** the SG „Pesticide package apple"(L.Blommers/NL) was established dealing mainly with the apple agroecosystem but also other fruit crops. Its aim is to "coordinate field trials in different European countries using a package of selective control agents and techniques with the emphasis on implementation in commercial fruit production". In general, most field trials led to a considerable reduction in the number of pesticide treatments and costs. The results obtained in this SG became of fundamental importance for developing guidelines for Integrated Production" (WPRS 1989). Table 2 summarises the situation of IPM in apple orchards around 1995. The content of this package has increasingly influenced the development of successful IPM programs of our days.

Table 2.
List of control agents in IPM regimes against the major pests in apple orchards in Western Europe.
Situation around 1995*

Pest species	Control agent
Fruit tree spider mite (*Panonychus ulmi)*	Predacious mite (*Typhlodromus pyri);* OP resistant strains
Codling moth (*Cydia pomonella)*	IGRs: diflubenzuron, teflubenzuron, flufenoxuron Granulosis virus (CpGv), pheromone mating disruption, attract and kill
Tortricid moths: (e.g. *Adoxophyes orana, Archips podana, Pandemis heparana)*	IGR: fenoxycarb nuclear polyhedrosis virus (NPV), mating disruption
Aphids: e.g. rosy apple aphid *(Dysaphis plantaginea)* and woolly apple aphid (*Eriosoma lanigerum)*	pirimicarb, ethiofencarb, thiomethon, vamidothion common earwig (*Forficula auricularia),*epizootic (*Entomophthera aphidis),* parasitoid *(Aphelinus mali)*

*) Explanation: The predacious mite *T. pyri* forms the essential factor in biological control of the fruit tree spider mite. It can only operate effectively if the other major pests, such as caterpillars and aphids, are controlled by selective pesticides or methods. Despite successful trials in commercial orchards use of this package was still limited around 1995 (Gruys 1982; Wildbolz 1988; Blommers 1994; Minks et al., 1998).

1988 brought the establishment of the Subgroup „Peach"(H.Audemar/F). It was transformed in 1993 into the WG „Stone Fruits"(P.Cravedi/I) and merged again with the "orchard group" in 2003.

1989 – present:
New conceptual momentum in Integrated Production or the "History of the Present".

In ***1989*** the orchard group established the Subgroup „Integrated Fruit Production Guidelines"(ErichDickler/D). This particular working unit had an interesting history and impact on the later developments at the WPRS level. After the retirement of Baggiolini in 1981 the concepts and application of Integrated Production in practice went through a "dormant stage" leading in 1987 to the closure of the IP Commission. Major developments had occurred during the 1980s outside IOBC especially in the new multidisciplinary approaches and projects of national societies of phytomedicine. Inspired by and relevant for WPRS was the Swiss society of phytomedicine established in 1982 under the influence of Vittorio Delucchi (founding member of IOBC). This professional forum did not only operate interdisciplinary projects involving entomologists, plant-pathologists, herbologists and agronomists but started in 1988 to evaluate existing IP and bio programs in Europe with novel evaluation criteria. It formulated in 1989 a first draft of a short definition of Integrated Production that was still lacking. In this context WPRS members became aware in 1989 of the vanished IOBC leadership in its former key competence and reacted in two ways:

1) the "orchard group" established its above mentioned Subgroup (directed personally by the convenor E. Dickler) and organised a workshop on "Guidelines and Labels: Defining Integrated Fruit Production (IFP) in European Countries" taking place at Ladenburg, Germany, 13 - 16 February 1990 (Dickler 1990). There the situation was reviewed and measures taken that led to the establishment of the first IOBC/WPRS standard for IP for pome fruits in 1991 – a joint project with the International Society of Horticultural Science (ISHS) (WPRS 1989).

2) Swiss entomologists requested that WPRS Council should consider the revival of the IOBC/WPRS IP-Commission closed in 1987. The new Council decided to do so and re-established the Commission in 1990.

1991: The first IFP Guideline (with updates in 1999, 2002, 2008) was a milestone in the further development of the IP concept and served as a model for subsequent IP-guidelines established for other crops (e.g. grapes, stone fruits, citrus and olives) (Dickler & Schäfermeyer 1991).

1992: The IP-Commission had elaborated in close collaboration with the crop-oriented IOBC/WPRS WG's and external expert a new updated IOBC concept and technical guidelines for Integrated Production (El Titi, Boller & Gendrier 1993). For the first time IOBC published a definition of Integrated Production that reads in its short version as follows:

IOBC Definition of Integrated Production (Integrated Farming)
Short Version

Integrated Production (Integrated Farming) is a farming system that produces high quality food and other products by using natural resources and regulating mechanisms to replace polluting inputs and to secure sustainable farming.

Emphasis is placed
on a holistic systems approach involving the entire farm as the basic unit,
on the central role of agro-ecosystems,
on balanced nutrient cycles, and
on the welfare of all species in animal husbandry.

The preservation and improvement of soil fertility and of a diversified environment are essential components. Biological, technical and chemical methods are balanced carefully taking into account the protection of the environment, profitability and social requirements.

Based on this definition – now applying to all IOBC/WPRS working units – the "orchard group" defined Integrated Fruit Production (IFP) as follows (Cross 2002):

IOBC/WPRS Definition of Integrated Production of Pome Fruits

In the frame of the IOBC definition for Integrated Production, Integrated Fruit Production (IFP) is defined as the economical production of high quality fruit, giving priority to ecologically safer methods, minimising the undesirable side effects and use of agrochemicals, to enhance the safeguards to the environment and human health.

Based on this short definition, Integrated Production of pome fruits emphasises the following objectives:

- To promote pome fruit production that respects the environment, which is economically viable and sustains the multiple functions of agriculture, namely its social, cultural and recreational aspects.
- To secure a sustainable production of healthy pome fruits of high quality with a minimal occurrence of pesticide residues.
- To protect the farmer's health while handling agrochemicals.
- To promote and maintain a high biological diversity in the ecosystem of the orchard and in surrounding areas.

OILB Rat
OILB Kommission "IP Richtlinien und Zertifizierung"

Definition und Ziele der Integrierten Produktion (Integrierte Landwirtschaft)

(Dieses Dokument ist integraler Bestandteil der OILB Richtlinien I, II und III)

INTEGRIERTE PRODUKTION IST EIN LANDWIRTSCHAFTLICHES BEWIRTSCHAFTUNGSSYSTEM, WELCHES

- NATUERLICHE RESSOURCEN UND REGULATIONSMECHANISMEN IN DAS BETRIEBLICHE ANBAUSYSTEM INTEGRIERT, UM DADURCH EINEN MAXIMALEN ERSATZ BETRIEBSFREMDER PRODUKTIONSMITTEL ZU ERREICHEN;

Dieses Ziel nimmt Bezug auf die Basis einer nachhaltigen Landwirtschaft. Ein überlegter und sorgfältiger Umgang mit den natürlichen Ressourcen kann dazu beitragen, ausserbetriebliche Produktionsmittel wie Dünger, Pflanzenbehandlungsmittel und Treibstoff zu ersetzen.Ein animal manure ,oder teilweiser Ersatz solcher Hilfsmittel vermindert nicht nur die Umwelt- ...h die Produktionskosten.

...QUALITATIV HOCHWERTIGER NAHRUNGSMITTEL
...OEKOLOGISCH ANGEPASSTER

This definition has been approved by a special *ad hoc* commission of IOBC/WPRS Wädenswil/Switzerland March 6.1992

Representatives and special experts of Council

H.S. Poitout, Secretary General
G. Briolini, Invited Expert

Commission on "IP-Labels and Certification"

A. El Titi, Chairman
E.F. Boller, Co-Chairman
J.P. Gendrier, Co-Chairman

Representatives of IOBC/WPRS Working Groups

J. Cross, Orchards
F. Häni, Farming Systems
Ch. Gysi, Vegetable Crops
V.H. Paul, Oilseed Rape
A. Schmid, Viticulture

Figure 14:

This strategic IOBC/ WPRS document describing the definition, objectives and basic principles of Integrated Production was signed at Wädenswil/ Switzerland on March 6, 1992 by 10 experts representing IOBC/WPRS Council, IP Commission and crop oriented Working Groups.
The „Orchard Group"was represented by Jerry Cross.

(El Titi, Boller & Gendrier 1993)

1993: Fritz Polesny/A becomes new Convenor, replacing Erich Dickler.

1996: Establishment of the two Subgroups „Arthropod Pests" (M. Solomon/UK) and „Soft Fruits" (D. Gayek/PL).

1998: First apple IP organisation (TRECOOP, Spain) endorsed by IOBC based on the new IP concept and standard 92.

2000: At the Syposium at Lleida (Spain) Jerry Cross/ UK was elected as new Convenor, replacing Fritz Polesny.

2004: New IOBC standard 2004 for Integrated Production becomes international bench mark (Boller et al. 2004).

2008: 250 specialists from 30 countries participated in the Symposium held on October in Avignon/F. Jerry Cross retired as Convenor and was replaced by Claudio Ioriatti / I. (Cross et al. in print).

Figure 15: The TRECOOP Label 1998

Multidisciplinarity

In 2005 WPRS had 10 crop-specific „horizontal "Working Groups. The WGs dealing with perennial crops in Central Europe (i.e. fruit crops and viticulture) showed the highest degree of interdisciplinary as assessed by publications between 1999 and 2004.

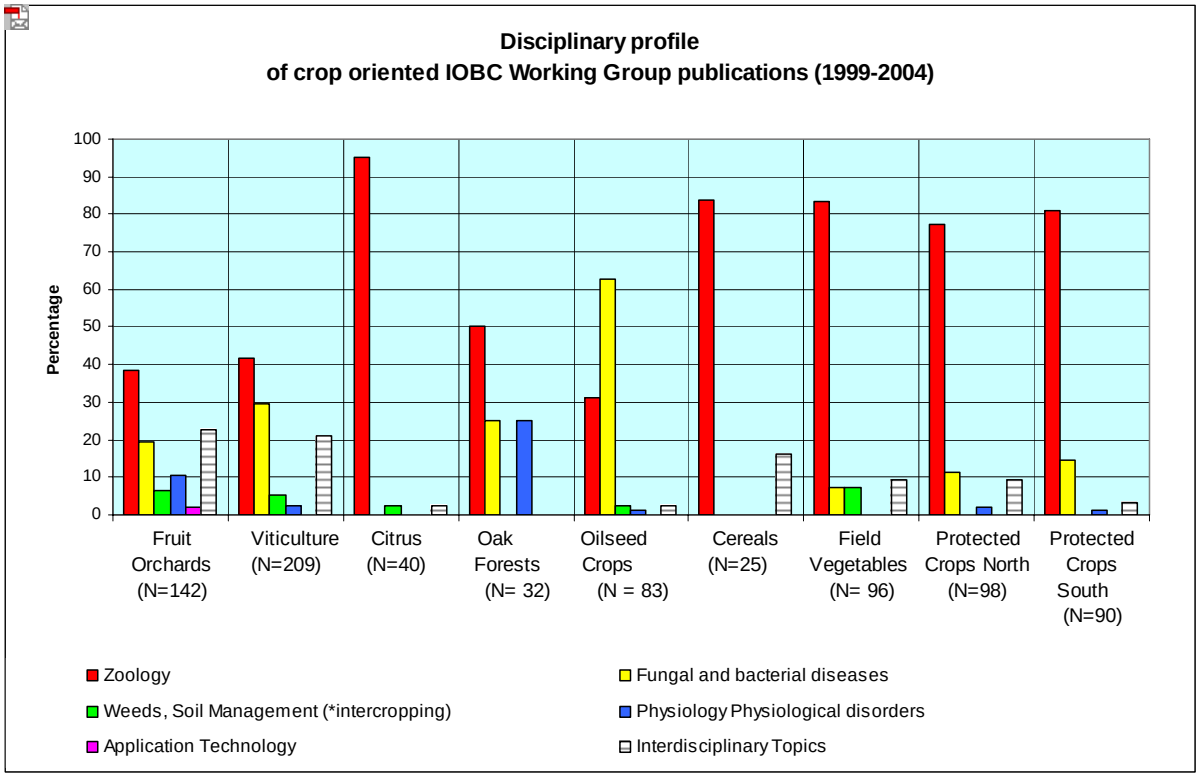


Figure 16: The disciplinary profile 2005 of the crop-oriented WPRS Working Groups (Boller et al. 2006).

Future perspectives by Jerry Cross

Forecasting the future is an activity of which scientists should be wary. However, accepting the obvious dangers, it is interesting to speculate about the future of the IOBC/WPRS IPP fruit crops working group. Its activities are secure for the foreseeable future. It will remain the central forum for meetings and exchange of scientific information for entomologists and plant pathologists working in the field of pest and disease management of fruit crops in Europe. The strong attendance at the IFP Avignon 2008 meeting, a record of 250 delegates (greater numbers would have attended had it been possible to accommodate them), is evidence of strong support and interest in the WG. There have been greater numbers of participants from eastern European countries and this trend is likely to continue. Numbers of entomologists and especially pathologists with a long-term specialisation in fruit crops are dwindling but this appears to be more than compensated by larger numbers with a short term interest. Unfortunately, the lack of representation by several countries with significant fruit growing industries remains a problem. But, to compensate, meetings not only attract participants from Europe and surrounding countries, but from America, Canada, Australia and New Zealand.

But what of the future scientific directions of the IPP fruit crops WG? The public have strongly negative attitudes to pesticides, fears which are stoked by pressure groups and the media. It seems unlikely that this attitude will change even in the long term. More recently, multiple retailers have started driving producers to minimise the incidence of pesticide residues in fresh produce, with fruit crops being at the forefront. Pesticides are still relied on for control of many pests and disease of fruit crops and there are still huge challenges in significantly reducing this dependence. Developing alternative non-pesticidal control strategies is thus likely to remain a central activity of scientists and a major focus for the activities of the WG. The development of alternative biocontrol and biotechnological control methods, though the subject of intensive research over several decades, is still in its infancy and extensive research will be needed for many years. Codling moth control has been the focus of most attention. Yet although a range of control strategies has been developed, including the use of pathogenic virus, sex pheromone mating disruption and, more recently, the use of entomopathogenic nematodes, methods are far from refined. Little attention has been devoted to the myriad of other pests. Pathologists have not made much progress in developing alternative methods for diseases, which remain a huge challenge. The most likely solution to the scab problem, still the main target for most pesticide applications to pome fruits, will be through the development of resistant varieties with durable, multi-gene resistance. In the longer term it is hoped that GM will become acceptable to the public in Europe, as it is already in the USA, as it seems unlikely that varieties with a high degree of acceptability to the market will be bred by conventional means. Other central themes for the activities of the WG are likely to be adaptation of Integrated Pest and Disease Management methods to climate change and sustainability within the rural landscape. Thus, there are many very significant scientific challenges. The special interest IOBC working groups will focus on these individually, but it is within the crop based IOBC working groups that the broader overview is presented and approaches are brought together into overall pest and disease management systems. So the IPP fruit crops WG will have a bright and enduring future as the main forum for scientific exchange in these important scientific fields.

Epilogue by Ernst Boller and Albert Minks

In this review we have focussed our attention on the first 25 years of the WG history, i.e. the “History of the Past”. The “History of the Present”, covering the second half of the 50-year period awaits to be written by a different team of authors actively involved in the more recent developments and events. The few facts and figures of the most recent history we have identified as important landmarks are far from being complete. Therefore, we did not attempt to analyse and describe in adequate detail their significance and impact. The first part of the history terminates in the mid 1980s with the departure of the founding generation and promoters such as Hans Steiner, Mario Baggiolini, Henry Milaire and others. A second generation of motivated scientists has continued the work and contributed to the success of WPRS-inspired IPM and Integrated Production programs in Europe reaching far beyond fruit growing. These members are still active and best qualified to analyse and describe the present situation.

Such a “History of the Present” would certainly explore and describe the influence of the WPRS-package (see Table 2) on actual IPM programs in sustainable pome fruit production. It would illuminate the influence of the WPRS concepts and standards for Integrated Production on national and international programs (e.g. Wiegand, Sessler & Becker 2004; Freier & Boller 2009). It would present the spread and actual status of IOBC-inspired Integrated Fruit Production and labels in Europe and outside the WPRS region. And last but not least, it would describe the scope and influence of the multidisciplinary activities of the subgroups and symposia of the “or-

chard group" (see figure 16). This analysis of the recent history would not only demonstrate the achievements and impact of the Working Group but also provide an interesting outlook on its future.
A first step in this direction has been made by Jerry Cross with his view on the future perspectives of the WG.

Acknowledgement

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Appendix 1:

Brochures produced by the Working Group (in chronological order)

1968. Steiner, H. & Baggiolini, M. (eds.). *Anleitung zum integrierten Pflanzenschutz im Apfelbau.* 1. Auflage. 64 pp.

1969. Bénassy, C. & Milaire, H.G. (eds.). *Introduction à la lutte intégrée en vergers de pommiers.*. 64 pp.

1971. Baggiolini, M., Keller, E., Milaire, H.G., & Steiner, H. (eds.). *Guide de détermination pour les controles periodiques en vergers de pommiers "Contrôle visuelle".* Brochure no. 2; 1ère édition. 62 pp.

1971. Baggiolini, M., Keller, E., Milaire, H.G., & Steiner, H. (eds.). *Bestimmungshilfe für Freilandkontrollen im Apfelbau.* .Heft Nr. 2; 1ère édition. 62 pp.

1974. Milaire, H. G., Baggiolini, M., Gruys, P. & Steiner, H. (eds.). *Les organismes auxiliaires en verger de pommes.* Brochure No. 3. Première edition. 242 pp.

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1975. Baggiolini, M., Keller, E., Milaire, H.G., & Steiner, H. (eds.). *Guida per i rilievi periodici di enemici del melo. Controllo visuale.* Volumetto N. 2. 80 pp.

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1992. Galli, P. & Höhn, H. *Visuelle Kontrollen im Apfelanbau.* Heft Nr. 2. Vierte, neu bearbeitete und erweiterte Auflage. 104 pp.

Appendix 2:

WPRS Bulletins and Proceedings produced by the Working Group and its Subgroups

(in chronological order of the meetings)

1979. Methodes de contrôle de la qualité intrinsèque des fruits. Proceedings of a meeting of the Commission for Valorisation of Integrated Production in the WG "Integrated Protection in Fruit Orchards", Aix-en-Provence (France), 23-24 August 1979. WPRS Bull. 1980 (3) 2; 99 pp.

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1980. La protection intégrée concernant les ravageurs et les maladies du poirier: bilan et perspectives. Proceedings of a meeting of the WG "Integrated Protection in Orchards", Zaragoza (Spain), 22-24 April 1980. WPRS Bull. 1980 (3) 7; 60 pp.

1980. Proceedings of the 1st meeting of the subgroup on integrated pest and disease control in hops of the WG "Integrated Protection in Orchards", Liblice (Czechoslovakia), 26-28 August 1980. WPRS Bull. 1981 (4) 3; 179 pp.

1980. Fertilizer use in integrated fruit production. Proceedings of a meeting of the Commission "Integrated Production", Changins, (Switzerland), 2-3 September 1980. WPRS Bull. 1982 (5) 1; 64 pp.

1981. Influence of pesticides on the beneficial fauna in fruit trees. Proceedings of a meeting of the WG "Integrated Protection in Orchards", Colmar, (France), 31 March - 1 April 1981. WPRS Bull. 1982 (5) 2; 90 pp.

1983. Disease resistance as component of Integrated Control in orchards. Proceedings of a meeting of the WG "Integrated Protection in Orchards", Angers, (France), 8-9 April 1983. WPRS Bull. 1983 (6) 4; 202 pp.

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1983. Proceedings of the 3rd meeting of the subgroup on integrated pest and disease control in hops of the WG "Integrated Protection in Orchards", Freising (Germany), 9-12 August 1983. WPRS Bull. 1984 (7) 6; 79 pp.

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1988. Proceedings of a meeting of the subgroup on peach orchards of the WG "Integrated Protection in Orchards", Valence (France), 31 August - 2 September 1988.WPRS Bull. 1988 (11) 7; 60 pp.

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1989. Proceedings of the International Colloquium organized by the subgroup on pear orchards of the WG "Integrated Protection in Fruit Orchards", Alcobaca (Portugal), 12-15 September 1989. WPRS Bull. 1990 (13) 2; 191 pp.

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1992. Proceedings of a meeting of the subgroup on peach orchards of the WG "Integrated Protection in Fruit Orchards", Rimini (Italy), 4-5 September 1992. WPRS Bull. 1993 (16) 4; 77 pp.

1993. Proceedings of the 5th International Colloquium on Integrated Control in Pear, organized by the subgroup on pear orchards of the WG "Integrated Protection in Fruit Orchards", Cesena (Italy), 11-15 October 1993. WPRS Bull. Vol.13 (2) 1994, 191 pp.

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1995. WG "Integrated Plant Protection in Orchards" in conjunction with ISHS WG "Integrated Fruit Production". Proceedings of the International Conference on Integrated Fruit Production at Cedzyna, Poland, 28 August - 2 September 1995. WPRS Bull. Vol 19 (4) 1996; 442 pp.

1996. Working Group "Integrated Plant Protection in Stone Fruit". Proceedings of the meeting at Zaragoza (Spain), 24 - 26 September 1996. WPRS Bull. Vol 20 (6) 1997; 115 pp.

1996. Proceedings of the 4th workshop on Integrated control of pome fruit diseases. WG "Integrated Protection in Orchards", subgroup „Integrated Control of Pome Fruit Diseases". Croyden (England), 19-23 August 1996. WPRS Bull. 20 (9) 1997; XIV + 276 pp.

1997. Working Group "Integrated Plant Protection in Stone Fruit" and ISHS Working Group "Integrated Fruit Production". Guidelines for Integrated Production of Stone Fruit in Europe. IOBC Technical Guideline III. 1st edition. WPRS Bull. Vol 20 (3) 1997, vi + 51 pp.

1997. Working Group "Integrated Plant Protection in Orchards. Soft Fruits". Proceedings of the Workshop at Vienna (Austria), 7 - 10 October 1997. WPRS Bull. Vol 21 (10) 1998; X + 108 pp.

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1999. Working Group "Integrated Plant Protection in Orchards", subgroup "Soft Fruits" together with the ISHS WG "Integrated Fruit Production". Second Workshop on Integrated Production of Soft Fruits. Warszawa/Miedzeszyn (Poland), 13-16 September, 1999.WPRS Bull. Vol 23 (11) 2000; xii + 169 pp.

1999. Proceedings of the 5th workshop on Integrated control of pome fruit diseases. WG "Integrated Plant Protection in Orchards", subgroup " Integrated Control of Pome Fruit Diseases". Fontevraud (France), 24 - 27 August 1999. WPRS Bull. 23 (12) 2000; XXIV + 291 pp.

2000. Working Groups "Integrated Plant Protection in Orchards" and "Integrated Plant Protection in Stone Fruits". International Conference on Integrated Fruit Production. Proceedings of the meeting at Lleida (Spain), 22 - 26 October 2000.WPRS Bull. Vol 24 (5) 2001; xx + 410 pp.

2000. 5th International Conference on Integrated Fruit Production. Abstracts. Lleida (Spain), October 22nd - 26th, 2000. 99 pp.

2001. Working Group "Integrated Plant Protection in Orchards", subgroup "Soft Fruits". Proceedings of a meeting at Dundee (Scotland), 18-21 September, 2001. WPRS Bull. Vol 26 (2) 2003; viii + 202 pp.

2002. Working Group "Integrated Plant Protection in Orchards", subgroup "Arthropod Pests". Proceedings of a Workshop on arthropod pest problems in pome fruit production. Vienna (Austria), 10 - 14 March 2002. WPRS Bull. Vol 26 (11) 2003; x + 119 pp.

2002. Working Group "Integrated Plant Protection in Stone Fruits". Proceedings of the meeting at Opatjia (Croatia), 14 - 16 October 2002. WPRS Bull. Vol 27 (5) 2004; vi + 142 pp.

2003. Working Group "Integrated Plant Protection in Orchards", subgroup "Soft Fruits". Proceedings of a Workshop on "Integrated Soft Fruit Production" at Conthey (Switzerland), 14 - 14 October 2003. WPRS Bull. Vol 27 (4) 2004; x + 176 pp.

2004. Working Groups "Integrated plant protection in fruit crops" and "Use of pheromones and other semiochemicals in integrated control". Proceedings of the 6th International Conference on Integrated Fruit Production. Baselga di Piné (Italy), 26 - 30 September 2004. WPRS Bull. Vol 28 (7) 2005; xxviii + 485 pp.

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2005. Working Group "Integrated Plant Protection in Fruit Crops", subgroup "Integrated Soft Fruit Production". Proceedings of a Workshop on "Integrated Soft Fruit Production" at Stavanger (Norway), 5 - 7 October 2005. WPRS Bull. Vol 29 (9) 2006; viii + 138 pp.

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2009. Proceedings of the 7th International Conference on Integrated Fruit Production. Avignon (France), 26 - 30 October 2008. (in prep.).